Regional Issues in Restructuring the Electric Industry

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For the past several years, the electric industry has been in significant turmoil, which will continue for years to come. Nearly every state in the United States is exploring whether and, if so, how to introduce competition and customer choice into retail electric markets where historically there has been only one monopoly utility service provider. Because electricity typically is supplied over transmission grids that cross state lines and from generators located long distances from centers of demand, many interstate and regional issues intersect with individual state decisions regarding competition and customer choice. Policy decisions made and actions taken by those in one state can dramatically affect conditions in neighboring and distant states. Concerns exist both in states that are moving to restructure their industries and in those that are more content with existing conditions.

Regional issues in electric industry restructuring stem directly from the regional nature of electricity production and delivery. Much of the impetus for competition springs from price differences across and within regions. Competitive electric markets will be much more closely tied to interstate systems for electric delivery than traditional service territories that fall within single states. Price conscious customers will create pressures to allow choice across state boundaries, and greater levels of coordination will be required among states that wish to foster efficient electricity markets. Indeed, in most areas of the United States, electric industry restructuring itself should be seen as a regional issue because the power markets it creates will be regional in nature.

This paper discusses several aspects of electric industry restructuring where regional concerns and the need for interstate coordination are particularly important. These are:

- Electric system reliability
- Environmental protection
- Market power
- Regulation of multi-state electric companies

Each of these topics easily could be the subject of a discussion the length of this overview paper. The intent here is to outline issues of importance to state legislators, regulators and others, and to identify needs and opportunities both for increased coordination among states and for actions that states may wish to take individually.

Electric System Reliability

Electric reliability is intrinsically a regional issue. Unlike some other utility services (like telephone service), electric power systems require precise, continuous and near instantaneous balancing of generation at power plants and customer demand at different locations around the regional grid, interconnected through high-voltage transmission lines and lower-voltage distribution lines. Although individual companies own the different facilities on the system, interconnected generation and transmission facilities must be physically operated in coordination with each other. Each physical region—many of which cross state boundaries—has a system operator who acts like an air traffic controller, making sure that the parts of the system are performing in unison. In emergencies or tight operating conditions, the system operator must take action to ensure that the facilities on the system are protected against damage from improper operations.

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Everyone agrees that electric system reliability must be maintained as competition is introduced into the electric industry.[1] And almost everyone agrees that electric industry restructuring and reliability can be compatible, so long as the proper policies are adopted.[2] Although many of the current policy issues are more national than regional or local in focus,[3] state legislators and regulators have a limited, but vital, role in ensuring system security. Historically, states have played an important role in reviewing plans to construct transmission facilities to ensure adequate supply and transmission capacity and, more recently, in holding utilities accountable for how reliably they provide power to consumers. State officials need to be aware of the effect that electric industry restructuring may have on these functions.

Transmission Siting

Because of the necessity to continually balance electricity supply and demand, the adequacy of electric transmission systems is inherently a regional reliability issue. Although the responsibility for setting transmission pricing and access terms lies with the federal government, the siting of power lines is subject to state jurisdiction.

Many states require developers of transmission facilities to obtain approvals for siting facilities at particular locations. Typically, these siting reviews require the developer to justify that the facility is needed by the state where it will be located, and that it is consistent with providing energy at lowest cost and minimum environmental effect. Although for many years these siting reviews have taken regional concerns into account, such concerns will assume greater importance in a restructured electric industry where states will rely on regional competitive markets to produce and deliver reasonably priced electricity. If regulators and consumers rely on regional power markets to set prices, and if these markets involve many buyers and sellers connected across state lines by transmission facilities, then regional concerns will be at the forefront of questions about the need for and location of transmission facilities.

What can states do regarding transmission siting and reliability?

- States can ensure that utilities continue to study and openly publish the results of reliability studies, so that the market participants can see where additional facilities (such as new transmission lines or new central station or smaller scale "distributed" generation facilities) are needed for reliability (and economic) purposes, or where demand-side management could be most usefully targeted.

- State legislatures can authorize state siting reviews to examine regional reliability concerns as reasons for approving a new facility proposal.
- States can urge Congress to authorize the voluntary formation of regional regulatory bodies. Under a recent proposal by the National Association of Regulatory Utility Commissioners (NARUC),[4] these entities would be authorized to oversee such regional issues as defining the character, planning, and pricing of regional transmission; siting facilities; and operating the transmission system, including through voluntary independent system operators.

Reliability Performance

Additionally, states have focused on retail service issues, including utility companies' responses to outages on the transmission and distribution systems. In the new deregulated environment, states will continue to have a clear interest in the performance of the bulk power system. When consumers lose power for any length of time, they typically do not care if it is a local distribution problem or a problem with the larger regional system; they take their complaints to the local regulators and politicians. Thus, states have an acute interest in ensuring that system operators have the correct incentives and necessary authority to ensure system reliability in a restructured environment.

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What can states do to ensure that regional and local reliability is maintained—if not improved—in a restructured industry? Some ideas that states are trying include the following.

- Some states have established performance standards and financial incentives for the local utility to minimize the number of times customers lose power for any reason, and to restore power once there is an outage.[5]
- State regulators can work together within regions to understand their common interests in the variety of changes that are under way at the industry's regional reliability councils and at the FERC regarding system security protocols, system coordination across control areas, independent system operators and so forth.[6]
- In some states, legislatures are adopting new electricity laws stating specifically the importance of continued system reliability, and are encouraging the use of independent system operators to accomplish this purpose.[7]
- State legislators and regulators can support congressional action to affirm state authority to ensure that all market participants adhere to appropriate health, safety and consumer protection standards, and to authorize states to form regional bodies on a voluntary basis to supervise the operation of interstate organizations for reliability purposes.

Environmental Protection

The interstate transport of pollution from electricity production and use provides a fundamental rationale for regional approaches to regulation. The electric industry contributes approximately two-thirds of the nation's sulfur dioxide (SO_2) emissions, and nearly one-third of the nation's nitrogen oxide (NO_x) and carbon dioxide (CO_2) emissions. Emissions from power production rarely respect state boundaries.

This issue is not new. Recently, however, many industry observers have explored how electric industry restructuring will affect pollution at existing and new facilities, and whether current environmental protection policies create distortions and unfair rules in competitive electricity markets. Clearly, the opening up of transmission facilities means that power producers have a much broader region in which they may attempt to sell their products. This provides low-cost plants in distant states a greater opportunity to market outside their area. Some of the low-cost plants with the greatest ability to increase their output are also some of the most polluting plants in the country;[8] increased generation at these plants will increase pollution locally and in downwind areas. This issue has been the topic of countless hours of discussion among environmental regulators and stakeholders including, within the Ozone Transport Commission, the Ozone Transport Assessment Group and the Grand Canyon Regional Haze Commission.[9]

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Over the longer term, it should be recognized that low-cost plants are likely to be fully utilized with or without restructuring due to projected demand growth in their local markets. Restructuring can help to promote environmental quality by providing opportunities for green power markets, for the marketing of efficiency services bundled with traditional electricity supply, and for renewable portfolio standards.

Perhaps the new issue that has been introduced into the restructuring debate is the need to look for ways to align economic and environmental policies—both within states and across states—so that environmental protection in the electric industry can occur in a cost-effective and efficient manner, and so that economic markets can function efficiently and fairly without distortions caused by environmental policies that treat different market participants differently.

Under most current state laws, utility regulators lack statutory authority to take actions that directly venture into the domain of environmental regulators. Nonetheless, regulators in some states are exploring ways to introduce environmental objectives into the competitive market structures they are creating for the electric industries in their states. NARUC itself has passed a resolution calling upon the U.S. Environmental Protection Agency to exercise its legal authority, leadership and responsibility under the Clean Air Act to address potential negative environmental consequences of electric industry restructuring, and urging state and federal public utility regulators to work with state and federal environmental regulators to secure continued progress toward cost-effective achievement of environmental quality goals.[10]

States are considering several ways of addressing environmental issues as part of restructuring:

- Since new power plants of almost any technology are likely to be environmentally cleaner and more efficient that existing plants, state legislatures and regulators can consider lifting or modifying existing siting statutes and regulations that now create stiff barriers to entry for new plants. The new regulatory approaches can focus on ensuring site suitability and minimizing environmental effects, rather than justifying the overall need for the plant, the latter of which should be left to market forces rather than regulatory reviews.[11]
- State legislatures that are adopting new electric restructuring laws can direct their utility regulators to work in coordination with other regulators in the region to bring upwind power plants into compliance with more stringent environmental standards.[12]
- State legislatures and environmental agencies can adopt regional emissions reduction and allowance trading programs and other forms of regional regulation that provide equal incentives (measured in dollar per ton of reduction) across all facilities (both local and upstream) that contribute to poor air quality in certain parts of the country.[13]
- State regulators can consider a non-bypassable charge paid for by all distribution service customers, to fund renewables resource development and energy efficiency programs.[14]
- State legislatures can require that all suppliers selling to retail customers in the state must have a percentage of their power from renewable resources—a requirement that suppliers may meet through tradable credits.[15]
- Environmental regulators working with utility regulators can implement generation performance standards for retail electricity transactions that occur in their states.[16]
- State regulators can encourage negotiated restructuring settlement agreements that include commitments by utility companies to bring their existing generating facilities into compliance with the emissions standards associated with new power plants in the region, with the cost of compliance included in the larger financial arrangements surrounding electric industry restructuring.[17]
- State legislatures can require retail suppliers of electricity in a state to provide information to consumers that discloses the fuel mix, environmental emissions and other features of the power supplies they offer.[18]
- State legislators or regulators can monetize values for environmental externalities and, when they do, transboundary issues should be carefully addressed as they were in California by the Public Utility Commission and the California Energy Commission.

Market Power

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Market power undermines the goals of competition, which relies on market forces rather than regulation to set efficient prices.[19] State officials who hope to withdraw from traditional cost-of-service regulation of generation should first assure themselves that the market in question is workably competitive. Since electricity generation markets typically span geographic regions larger than a state, market power issues generally are regional concerns. Larger generation markets will be able to address market power concerns more effectively because they will tend to have a larger number of competitors.

At the federal level, FERC has reviewed both horizontal and vertical market power questions in several situations.[20] Now that retail generation markets are being opened to market forces, states are taking a new look at how to regulate against the abuse of horizontal and vertical market power:

- States have encouraged—and, in some instances, required—electric companies to divest parts of their generation assets.[21] Additionally, states have taken steps to protect customers who stay with the host utility by requiring that the local distribution company supply those customers with market-priced power from a power exchange.[22]
- In other states, where regulators believe either that they lack the authority to order divestiture, or that divestiture is undesirable or unnecessary, other approaches have been considered, such as:
  - ❑ Requiring vertically integrated utilities to adopt and abide by codes of conduct for relationships among affiliated units;
  - ❑ Requiring vertically integrated utilities to make their transmission facilities subject to operation and coordination by independent system operators;
  - ❑ Limiting their supplier certification rules to avoid the creation of barriers to entry for new market participants;
  - ❑ Working with independent system operators in the region to develop criteria and protocols for identifying market power problems and for implementing mitigation where necessary; and
  - ❑ Avoiding adoption of reciprocity requirements that would restrict the number of participants in the generation market.
- Legislatures are considering strengthening their states' ability to prosecute antitrust violations, in part through withdrawal of the current immunity enjoyed by utilities (known as the "State Action" exemption) from the application of antitrust laws.

Regulation of Interstate Electric Companies

Companies that are subject to regulation in more than one state present a number of challenges to state officials.

Many electric utility companies operate in more than one state, and do so under various corporate arrangements, some of which make it difficult for states to regulate them. Competition will increase the number of multi-state companies as markets are opened to competitors across state boundaries. Companies that are subject to regulation in more than one state present a number of challenges to state officials.

PUHCA Reform

Some multi-state companies are public utility holding companies that are organized and must operate under particular legal restrictions according to federal law. In the national debates over electric industry restructuring, many of these holding companies have argued that the Public Utility Holding Company Act (PUHCA) unfairly prevents them from doing things that many of their competitors are allowed to do. For several years, many utilities have encouraged Congress to repeal PUHCA. Recently, other parties have stated their agreement that PUHCA is outmoded and should eventually be repealed, but only as part of a comprehensive package of reforms relating to electric industry restructuring.[23]

NARUC has adopted a resolution that supports PUHCA reform as part of comprehensive industry restructuring legislation, as long as the legislation provides for such authorities as:

- State consent for sale, encumbrance or disposition of existing state jurisdictional rate-based facilities;
- Federal and state commission access to books and records;
- Independent audit authority for state commissions;
- Non-preemption of state rate authority;
- Maintenance of state authority concerning the provision of utility services to regulate the activities of a public utility that is an affiliate, subsidiary or associate of a multi-state public utility holding company; and
- Maintenance of state authority to review prospective requests for diversification, if a state so chooses, and to require that holding companies place nonutility businesses in separate subsidiaries, to regulate all interaffiliate transactions, and to require divestiture of utility businesses.[24]

Interstate Regulatory Issues

Many high-cost states are worried that it will be unfair to utilities within their state if they open their retail market to customer choice but neighboring states do not. Local utilities will face competition but will not have adequate opportunity to expand their market. Other states now enjoy the benefits of low-cost power from their utility companies, and some public officials in those states have expressed concern that local electricity prices will rise as their suppliers begin to participate in the high-cost markets of neighboring states. This has caused at least one state with low electricity rates to take a wait-and-see attitude about customer choice, fearing that benefits to their own residents are unproven and risky.

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States are considering several other approaches to addressing real and potential inconsistencies in regulation across state boundaries:

- Some states that regulate interstate companies are attempting to coordinate regulatory consistency across states by adopting policies that go into effect when triggered by events in other states.[25]
- Low-cost states that retain cost-of-service regulation can exercise control over the rates charged to retail customers in the state even if the utility participates in out-of-state competitive markets where market-clearing prices exceed in-state regulated prices; the in-state regulators can adopt cost recovery policies that set rates for in-state ratepayers based on a least-cost of supply to local ratepayers. In this sense, these regulators can directly target certain supplies for their local residents.
- States that open their retail markets and allow their utilities to participate in regional competitive generation markets can look to the higher revenues such transactions will generate as a way to offset any increases in generation prices that local consumers otherwise might have to pay. In some ways, these revenues are the inverse of stranded

costs: they are benefits that flow to ratepayers associated with past investment in economical plants.

- At least one state with relatively low rates in its region has decided to proceed to restructure its electric industry, in part as a defensive action in light of similar activities that are occurring in high-cost neighboring states. This state decided, among other things, that it wanted to capture some of the early benefits of competition for its consumers.
- Some states have considered—but none have yet adopted—a reciprocity requirement, where a state would permit out-of-state companies to participate in its newly opened retail markets only if the companies' home state(s) "reciprocated" by opening up their retail markets.

Conclusion

Policy decisions made and actions taken by one state can dramatically affect activities and conditions in neighboring and distant states.

Although each state will decide for itself whether and, if so, how and when to move to retail competition in the electric industry, these decisions will be affected—in large and small ways—by the activities of legislatures, regulators, industry participants and consumers in other states in their region. Policy decisions made and actions taken by one state can dramatically affect activities and conditions in neighboring and distant states.

Moreover, the very move to introduce competition into electric generation markets may require a move toward increased interstate coordination and interaction in the electric power industry. Fueled by price differences between states, electricity markets will strain regulatory boundaries and highlight discrepancies in statutory and regulatory policy.

This paper has outlined many issues of importance to state legislators, regulators and others involved in the production and consumption of electricity and has identified actions those individuals may wish to consider. Key issues relate to the need for strategic changes in state policy, regional coordination, and, in some cases, even regional regulation, to ensure regional reliability, environmental protection, efficient regional power markets and appropriate regulation of interstate utility companies.

Notes

1. In the National Association of Regulatory Utility Commissioners' (NARUC) *Principles to Guide the Restructuring of the Electric Industry,* July 25, 1996, NARUC stated as its first principle that "the safety, reliability, quality and sustainability of electric service should be maintained or improved in a restructured electric industry."

2. See, for example, the Department of Energy's Task Force on Reliability, made up of a diverse group of electricity producers, marketers, state agencies, consumers, environmental, groups and others (*Interim Report*, July 24, 1997).

3. Because the interconnected grid spans not only states but international borders within North America, reliability issues involve extremely large geographic regions. Historically, system reliability has been undertaken by the electric industry itself through a voluntary system of self-governance under the North American Electric Reliability Council (NERC) and the regional reliability councils, with little statutory authority given to federal agencies to regulate reliability *per se*. Concerns that arise in a restructured industry include: how to ensure that system operators base their reliability decisions on system security needs, rather than on having a financial stake in whose power transactions are cut off or restored first in emergencies or tight operating conditions; and how to ensure that all market participants adhere to common, fair and technically appropriate reliability rules. The Federal Energy Regulatory Commission (FERC) has determined that system operators must make operational decisions in a manner that does not discriminate for or against any particular market participants. Since NERC now lacks legal authority to enforce its rules, discussions are under way in Washington, D.C., about what legislation might be needed to ensure compliance with reliability rules, perhaps by giving FERC the authority to approve and enforce reliability rules proposed by a reformed NERC organization.

4. Testimony of Commissioner Bruce Ellsworth of New Hampshire, president of NARUC, on behalf of NARUC, before the Senate Energy Committee, March 20, 1997.

5. Examples are California (AB 1890 (1996)) and Massachusetts (Act Relative to Restructuring the Electric Utility Industry in the Commonwealth, November 1997).

6. Regulators and energy officials in the West, for example, have a long history of working together under the auspices of the Western Interstate Energy Board's Committee on Regional Electric Power Cooperation to deal with issues of common interest. Another region with a strong tradition of interstate cooperation and coordination among regulators is New England, under the auspices of the New England Governors' Conference and the New England Conference of Public Utilities Commissioners.

7. See, for example, Pennsylvania's Generation Customer Choice and Competition Act (1996), Section 2802 (19-20); California's restructuring act (AB 1890); and Massachusetts' restructuring act (November 1997).

8. NRDC study, *Benchmarking Air Emissions of Electric Utility Generators in the Eastern United States*, 1997.

9. The environmental issue is not limited only to air issues. In the Pacific Northwest, the major area of tension between power production and environmental issues has to do with protection of salmon; in various parts of the country, the environmental issues have included nuclear and hazardous waste siting, global climate issues, and the use of renewable resources and demand-side management to avoid electricity production altogether.

10. NARUC Resolution on Coordination Between Utility and Environmental Regulators Concerning Electric Industry Restructuring in the United States, February 28, 1996.

11. The new Massachusetts restructuring act has eliminated the requirement that new power plant applicants must justify the need for the plant, under the perspective that the competitive market—rather than regulators—should decide which plants are needed; the act, however, does retain the requirement that applicants receive all necessary state and local environmental and land-use requirements, including those from the Energy Facilities Siting Board.

12. See, for example, the Pennsylvania restructuring act.

13. The states in the Ozone Transport Region have adopted a program to reduce emissions of nitrogen oxides through the use of allowance-based cap and trading programs.

14. California and Massachusetts have adopted this approach. Moreover, NARUC passed a resolution in November 1996 supporting states' authority to impose non-bypassable charges to support stranded benefits, including energy efficiency, renewables and low-income programs.

15. Maine's and Massachusetts' new statutes, for example, include a renewables portfolio standard.

16. Regulators in Massachusetts and Vermont have adopted a "generation performance standard" as part of their restructuring policies and their governors' proposed bills.

17. See, for example, the settlement agreement of Massachusetts Electric Company.

18. Pennsylvania, for example, has required that generation suppliers indicate the fuel mix of their supplies.

19. See "Market Power in the Electric Industry: An Overview," by William G. Shepard, *The Electric Industry Briefing Papers* of the National Council on Competition and the Electric Industry, November 1997.

20. FERC has approved marketers' applications to sell power at market prices only in cases where the applicant can demonstrate that it does not hold horizontal market power in the relevant markets. With regard to vertical market power, FERC has imposed functional and accounting separation of monopoly and competitive services; codes of conduct; and restrictions on information sharing to ensure that, for example, a transmission company that is part of a vertically integrated utility company provides nondiscriminatory transmission services to affiliates on the same basis it supplies them to all other suppliers.

21. Maine has required divestiture of certain generation assets, and California and Massachusetts have created financial incentives for divestiture of certain generation assets.

22. See, for example, California. Pennsylvania has required that utility providers of "last resort basic service" to customers do so at prevailing market prices.

23. Deputy Secretary of Energy Elizabeth Moler stated this position in commenting on the Clinton administration's position on Public Utility Holding Company Act (PUHCA) repeal at the Senate hearing on PUHCA (July 1997).

24. NARUC Resolution on Legislation to Change the Public Utility Holding Company Act of 1935, adopted at the 1995 NARUC winter meetings. Other parts of this resolution included: reporting obligations concerning investments and activities of multi-state public utility holding company systems; restrictions against assumption of liabilities of nonregulated activities through securities issuances, guarantees, endorsements, or other pledging of assets; and protection against abusive affiliate transactions.

25. Rhode Island's Utility Restructuring Act of 1996, for example, includes dates for the phase-in of retail choice, which is introduced on a faster schedule if retail choice is made available to more than 40 percent of the region, based on kilowatt-hour sales.

Additional Reading

◆ Timothy Brennan, Karen Palmer, Raymond Kopp, Alan Krupnick, Vito Stagliano and Dallas Burtraw. *A Shock to the System: Restructuring America's Electricity Industry.* Washington, D.C.: Resources for the Future, 1996.

This book is a useful book for introducing readers to the issues surrounding electric industry restructuring. It provides concise and easily readable material for nonexperts. It is relatively short, making it especially helpful for readers with busy schedules who want to understand the issues in more depth than provided in this paper.

The book provides an overall introduction to restructuring issues, starting with a brief discussion of why the changes under way in the electric industry are important for the country's consumers, the economy and the environment.

Then the book focuses on six issues that the authors believe are at the heart of the competition and restructuring debate:

- The current structure of the electric industry and the imprint of its history of industrial organization, regulation and legislation;
- The structure and organization of the new markets that are developing, in which decisions by many buyers and sellers will shape the types of products and services produced and consumed in electricity markets;
- The pricing and regulation of transmission;
- Unbundling of the industry, involving separation of previously vertically integrated functions into competitive generation markets and regulated transmission and distribution functions;
- The economics and politics of stranded cost recovery; and
- The implications for the environment, energy efficiency and renewable resource development associated with competition in the electric industry.

The book has brief chapters on several of the topics covered in this paper, including transmission regulation, market power and environmental protection.

The book is not intended to provide answers; instead, the authors identify the major issues and choices facing the participants—and especially policy makers—in the industry. The book provides different ways in which various parties are trying to direct the course of change in the industry, and they describe the pros and cons associated with these options.

Part of the reason for the book's usefulness stems from the breadth of experience represented by its authors, all of whom have been affiliated with Resources for the Future (RFF) and have background in government policy settings and academia. Tim Brennan is a professor of policy sciences and economics at the University of Maryland, as well as a senior fellow at RFF. Ray Kopp is the director of RFF's Quality of the Environment Division. Both Karen

Palmer and Dallas Burtraw are fellows at the Quality of the Environment Division. Karen has a background in state regulatory policy and the economics of electricity markets, and Dallas is an expert in evaluating pollution control polices and economics. Alan Krupnick is an economist and senior fellow at RFF, who also spent time as a staff member of the Council of Economic Advisors. Finally, Vito Stagliano, formerly a visiting fellow at RFF, was for many years a senior official in the Department of Energy's Office of Domestic and International Energy Policy.

The authors can be contacted and the book obtained through Resources for the Future, 1616 P Street, N.W., Washington, D.C., 20036-1400, (202) 328-5000. To obtain the book through bookstores, use its locator number, ISBN 0-915707-80-2.

◆ Peter Fox-Penner. *Electric Industry Restructuring: A Guide to the Competitive Era.* Vienna, Va.: Public Utilities Reports Inc., 1997.

As its title suggests, this book provides a comprehensive overview of issues relating to the restructuring of the electric industry, including the regional issues discussed in this paper.

Some of the most useful sections—for policymakers who are interested in better understanding the roots of the industry that have shaped its current circumstances—are the first few chapters that provide background material about the electric industry. These chapters cover the industry's history, told in brief capsule form; some of the key economic and technological features of the industry that shape its special operational requirements and organizational features; key legal and regulatory events and trends that have shaped the industry; and recent trends in this and other traditionally regulated industries that have positioned the electric industry for its current restructuring.

In other chapters, Dr. Fox-Penner covers the gamut of issues associated with the options for introducing market forces into the industry, the variety of likely effects of increased competition, and the policy issues that present themselves to policymakers, industry participants and consumers.

In particular, there are chapters on the effect of electric production and use on the environment, on power system reliability and on market power considerations.

In these chapters, Dr. Fox-Penner flags issues and raises questions. He educates and informs readers about the underlying factors that are affecting change, the implications of change, and the options available to policymakers.

Dr. Fox-Penner looks at these issues from both an economist's and a policy analyst's perspective, drawing upon his extensive background as a private economic consultant, a senior official at the Department of Energy and an advisor to the White House Office of Science and Technology Policy. Dr. Fox-Penner is currently with the Washington, D.C., office of The Brattle Group.

The book can be obtained from Public Utilities Reports Inc., the publisher of *Public Utilities Fortnightly*, Vienna, Va., (800) 368-5001. To obtain the book from bookstores, use its locator number, ISBN 0-910325-67-7.

- Energy Information Administration, U.S. Department of Energy, Washington, D.C.
  Although EIA is best known for collecting and publishing detailed data and reports about energy production and use—including data on the electric industry—it also prepares studies on special topics, including ones relevant to the issues covered in this paper. Recent relevant studies include *Performance Issues for a Changing Electric Power Industry* (1996), which focuses on electric reliability issues; *Analysis of the Federal Energy Regulatory Commission's Environmental Impact Statement for Electricity Open Access and Recovery of Stranded Costs* (1996); and *Electric Prices in Competitive Environment* (1997). These can be obtained by contacting EIA's National Energy Information Center in Washington, D.C., (202) 685-8800, or through the Internet at EIA's useful website at www.eia.doe.gov.

- Task Force on Electric Reliability of the Secretary of Energy's Advisory Board
  This task force was established by the secretary of energy at the direction of President Clinton after several widescale power outages occurred in the West during 1996. Charged with advising on key institutional, policy and technical issues relating to the reliability of the bulk power system in light of changes under way in the electric industry, the task force has issued a series of reports and background papers, including its *Interim Report on Electric Systems Reliability* (July 24, 1997), and position papers on *Maintaining Bulk-Power Reliability through Use of a Self-Regulating Reliability Organization* (November 6, 1997) and on *The Characteristics of the Independent System Operator* (March 10, 1998). Additional work is under way on technological issues and incentives for adequate transmission capability.

  The task force is comprised of 24 members representing electricity producers, marketers, state agencies, consumers, environmental advocates, reliability organizations and experts. To discuss reliability issues, contact Paul Carrier in DOE's Policy Office at (202) 586-5659. The task force papers can be obtained from Rich Burrow of the Secretary of Energy Advisory Board, U.S. DOE, Washington, D.C. (202) 586-1709. Its website is www.hr.doe.gov/seab.

- *Air Quality and Electricity Restructuring: A Framework for Aligning Economic and Environmental Interests under Electricity Restructuring*, Center for Clean Air Policy, Washington, D.C.
  Beginning in early 1995, the Center for Clean Air Policy assembled a group of participants in electric restructuring activities from around the country and started work to identify and quantify changes in air quality that might arise as a result of changes in the electric industry, and to develop measures to avoid or mitigate any adverse environmental effects. This report presents the findings and policy recommendations of this dialogue among industry participants. In general, the group identified a number of possible ways in which restructuring could adversely affect environmental quality, and it offered several policy proposals to align environmental interests with competitive markets. The report can be obtained from the center by calling (202) 408-9260.

Resource Centers

National Regulatory Research Institute, Ohio State University, Columbus, Ohio 43210. ◆
NRRI is a nonprofit research organization established by the National Association of Regulatory Utility Commissioners to provide relevant policy and technical research for utility regulators. NRRI has conducted research on a variety of topics, including market power, transmission, environmental issues and regional regulation. NRRI publications include these research results as well as other papers from industry and governmental experts published in the NRRI *Quarterly Bulletin* and through the NRRI On-Line Newsletter. Publications can be obtained by calling NRRI at (614) 292-9404 or through the Internet at www.nrri.ohio-state.edu.

NRRI's principal contacts for information about electric reliability, market power, and environmental and regional regulation issues are Kenneth Costello, associate director for electricity and gas; Robert Burns, attorney and senior research specialist; and Dr. Kenneth Rose, senior institute economist.

Harvard University, Kennedy School of Government, Cambridge, Mass. ◆
Harvard's Kennedy School has many experts on electric industry policy, economics and environmental issues. For approximately the past five years, the Harvard Electric Policy Group has met to analyze and discuss a wide range of issues relating to the restructuring of the electric industry. Topics include reliability, transmission issues, market power issues, environmental issues and jurisdictional tensions between state and federal governments and among states. HEPG has published countless papers and summaries of its proceedings, which can be obtained by calling (617) 496-6760.

The Kennedy School has several experts knowledgable in the subjects covered in this paper. Professors Bill Hogan and Ashley Brown co-direct the Harvard Electric Policy Group. Bill is a professor of economics and is internationally known for his work on independent system operators and regional power markets. Ashley is a lawyer and former public utility commissioner with extensive experience in federal/state and state/state issues as well as transmission policy. Professor Joseph Kalt is an expert on antitrust and market power.

Also at the Kennedy School are Henry Lee and Rob Stavins, both of whom are experts on environmental and electric industry policy and economics. Henry is the director of the Kennedy School's Center for Environment and Natural Resources and has two decades of experience on issues at the intersection of electric industry policy and environmental policy. Rob is an economist, professor of public policy and an expert on issues relating to the introduction of market forces into environmental policy.

Massachusetts Institute of Technology, Center for Energy and Environmental Policy Research, ◆
Cambridge, Mass.
The center at MIT is directed by Richard Schmalensee and includes Prof. Paul Joskow and executive director Denny Ellerman. The center conducts scholarly and policy research on energy and environmental issues. Paul is chairman of the Economics Department and an

expert on electric industry economics. Dick Schmalensee, also an economist, has published extensively about utility and environmental economics. The center's phone number is (617) 253-3551.

- The Regulatory Assistance Project, Gardiner, Maine.
  RAP is a nonprofit group that provides analytic assistance and workshops to regulators at public utility commissions nationwide. RAP produces newsletters and other publications about the topics addressed in this paper. RAP is co-directed by David Moskovitz, an attorney and engineer who was formerly public utility commissioner from Maine and a former public utility employee, and Cheryl Rapp, also an attorney and former Maine PUC commissioner. The project can be contacted at (207) 582-1135 or through NARUC's web site at http:\\www.naruc.org.

- Oak Ridge National Laboratory, Energy Division, Oak Ridge, Tenn.
  Oak Ridge National Laboratory's Energy Division provides expertise on electric industry issues, including many of the topics addressed in this paper. Most notably, Dr. Eric Hirst has worked for decades on economic and technical policy issues in the electric industry. His recent work has included reliability studies and analyses. He can be contacted at (423) 574-6304.

Other Experts in the Private Sector, Public Sector and Non-Governmental Organizations

Ralph Cavanaugh, Natural Resources Defense Council, San Francisco, Calif., (415) 777-0220. ◆
Considered one of the leading experts and advocates in environmental issues that affect the electric industry in the West and nationally, Ralph has long been known for his work in promoting energy efficiency. A lawyer, he also has been active recently on regional questions relating to environmental comparability and reliability.

Paul Centolella, senior economist, Science Applications International, Dublin, Ohio, (614) 793-7600. ◆
A lawyer and economist, Paul has performed a number of studies on several of the issues discussed in this paper, most notably transmission, environmental and market power issues.

Armond Cohen, director, and **Steve Brick**, policy coordinator, The Clean Air Task Force, Boston, Mass., (617) 292-0234. Formerly a staff attorney at the Conservation Law Foundation where he was active in promoting energy efficiency and least-cost planning at electric utilities, Armond now directs the Clean Air Task Force; its work focuses on environmental issues in electric industry restructuring. He is particularly involved on environmental comparability issues. His colleague, Steve, is a former public utility commission staff member who specializes in the technical and policy issues associated with the environmental implications of electric restructuring. ◆

Howard Gruenspecht, director of the Office of Economic, Electricity and Natural Gas Analysis, Policy Office of the U.S. Department of Energy, Washington, D.C., (202) 586-5337. ◆
A Ph.D. economist, Howard has been a senior policy official and analyst at DOE's Policy Office, where his work has focused on energy economics and policy. Recently, he has been involved in modeling the environmental effects of electric industry restructuring.

Scott Hempling, attorney at law, Silver Spring, Md., (301) 681-4669, e-mail Hempling@ari.net. ◆
A regulatory lawyer with a national reputation and experience working with consumer advocates and regulatory commissions, Scott is particularly expert in issues at the intersection of state and federal regulatory law and regulation, such as regulation of multi-state electric companies, transmission and market power.

Robert Nordhaus, attorney, Van Ness Feldman, Washington, D.C., (202) 298-1910. ◆
Formerly general counsel at the Department of Energy and the Federal Energy Regulatory Commission as well as a congressional committee staff person, Bob is a well-known and well-respected expert in electric utility policy, regulation and law. He has experience in all of the topics covered in this paper.

- **Richard Rosen**, Tellus Institute, Boston, Mass., (617) 266-5400.
  A Ph.D. physicist, Rich—vice-president of Tellus—has a lengthy background in analyzing technical and economic issues in the electric industry (including market power), especially for consumer advocates and public utility commissions.

- **Robert Shapiro**, Rubin & Rudman, Boston, Mass., (617) 330-7102.
  An attorney now in private practice involved in electric utility regulation issues, Rob spent a decade in state government as the head of Massachusetts' Energy Facilities Siting Council and later as general counsel at that state's Department of Public Utilities. While experienced and knowledgeable in all of the topics covered in this paper, he is particularly expert in facility siting regulation, law and politics.

- **Charles Stalon**, **c**onsultant, Cape Girardeau, Mo., (314) 335-3145.
  A Ph.D. economist, Dr. Stalon has decades of experience in utility economics and regulation. He spent many years as a state public utility commissioner in Illinois and as a commissioner on the Federal Energy Regulatory Commission. He now is an economic and policy consultant. He brings a strong pro-competition orientation and sophisticated insights to the regional issues discussed in this paper.